Complete Summary

GUIDELINE TITLE

Preterm birth prevention.

BIBLIOGRAPHIC SOURCE(S)

Institute for Clinical Systems Improvement (ICSI). Preterm birth prevention. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2004 Jul. 56 p. [94 references]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

- Preterm birth (PTB) (Prevention)
- Preterm labor (PTL) (Management)

GUIDELINE CATEGORY

Evaluation
Management
Prevention
Risk Assessment

CLINICAL SPECIALTY

Family Practice
Obstetrics and Gynecology
Preventive Medicine

INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Health Care Providers
Health Plans
Hospitals
Managed Care Organizations
Nurses
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

- To increase the routine identification of preterm birth (PTB) risk factors in all pregnant women
- To increase the rate of interventions for identified PTB risk factors
- To increase patient education for PTB prevention and preterm labor (PTL) signs and symptoms for at-risk patients
- To increase the rate of appropriate interventions for identified change in status in women with PTB risk factors
- To increase the percentage of women with PTL and/or PTB who receive appropriate betamethasone

TARGET POPULATION

All women of childbearing age

INTERVENTIONS AND PRACTICES CONSIDERED

Prevention/Risk Assessment

1. Preconception counseling
2. Patient education for preterm birth (PTB) prevention and preterm labor (PTL) signs and symptoms for at-risk patients
3. Assessment of risk factors for PTB, including activated fetal or maternal hypothalamic-pituitary-adrenal axis, inflammation, decidual hemorrhage, pathologic distention of uterus, maternal illness associated with indicated preterm delivery
4. Monitoring of pregnancy and risk status

Management

1. Management of signs/symptoms of PTL: medical evaluation (pelvic exam, sterile speculum exam, contraction pattern, determination of fetal well being, laboratory tests, and possible treatment)
2. Patient education related to management of PTL
3. Monitoring and management of prodromal PTL, such as observation, rechecks of cervix, bed rest and pelvic rest
4. Management of active PTL
5. Management of PTL with rupture of membrane or bleeding (e.g., sterile speculum visual estimate of cervical dilation and effacement; bed rest, monitoring of white blood cell count, urinalysis/urine culture; vaginal pool

with or without amniocentesis, fetal monitoring, other lab work as appropriate)
6. Pharmacologic management of PTL or risk factors for PTL (tocolytic therapy [e.g., magnesium sulfate, terbutaline sulfate, ritodrine, and calcium channel blockers such as nifedipine]); betamethasone or other corticosteroid; antibiotic therapy for bacterial vaginosis (e.g., ampicillin, a combination of ampicillin and erythromycin, , metronidazole)
7. Delivery and postpartum follow-up

MAJOR OUTCOMES CONSIDERED

- Rates of preterm labor (PTL) and preterm birth (PTB)
- Maternal and neonatal morbidity and mortality

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

No additional description of literature search strategies is available.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Key conclusions (as determined by the work group) are supported by a conclusion grading worksheet that summarizes the important studies pertaining to the conclusion. Individual studies are classed according to the system presented below, and are designated as positive, negative, or neutral to reflect the study quality.

Conclusion Grades:

Grade I: The evidence consists of results from studies of strong design for answering the question addressed. The results are both clinically important and consistent with minor exceptions at most. The results are free of any significant doubts about generalizability, bias, and flaws in research design. Studies with negative results have sufficiently large samples to have adequate statistical power.

Grade II: The evidence consists of results from studies of strong design for answering the question addressed, but there is some uncertainty attached to the conclusion because of inconsistencies among the results from the studies or because of minor doubts about generalizability, bias, research design flaws, or adequacy of sample size. Alternatively, the evidence consists solely of results from weaker designs for the question addressed, but the results have been confirmed in separate studies and are consistent with minor exceptions at most.

Grade III: The evidence consists of results from studies of strong design for answering the question addressed, but there is substantial uncertainty attached to the conclusion because of inconsistencies among the results of different studies or because of serious doubts about generalizability, bias, research design flaws, or adequacy of sample size. Alternatively, the evidence consists solely of results from a limited number of studies of weak design for answering the question addressed.

Grade Not Assignable: There is no evidence available that directly supports or refutes the conclusion.

Study Quality Designations:

The quality of the primary research reports and systematic reviews are designated in the following ways on the conclusion grading worksheets:

Positive: indicates that the report or review has clearly addressed issues of inclusion/exclusion, bias, generalizability, and data collection and analysis.

Negative: indicates that these issues (inclusion/exclusion, bias, generalizability, and data collection and analysis) have not been adequately addressed.

Neutral: indicates that the report or review is neither exceptionally strong nor exceptionally weak.

Not Applicable: indicates that the report is not a primary reference or a systematic review and therefore the quality has not been assessed.

Classes of Research Reports:

A. Primary Reports of New Data Collection:

Class A:

- Randomized, controlled trial

Class B:

- Cohort study

Class C:

- Nonrandomized trial with concurrent or historical controls
- Case-control study
- Study of sensitivity and specificity of a diagnostic test
- Population-based descriptive study

Class D:

- Cross-sectional study
- Case series
- Case report

B. Reports that Synthesize or Reflect upon Collections of Primary Reports:

Class M:

- Meta-analysis
- Systematic review
- Decision analysis
- Cost-effectiveness analysis

Class R:

- Consensus statement
- Consensus report
- Narrative review

Class X:

- Medical opinion

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

The guideline developers reviewed published cost analyses.

METHOD OF GUIDELINE VALIDATION

Clinical Validation-Pilot Testing
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Institute Partners: System-Wide Review

The guideline draft, discussion, and measurement specification documents undergo thorough review. Written comments are solicited from clinical, measurement, and management experts from within the member medical groups during an eight-week period of "Critical Review."

Each of the Institute's participating medical groups determines its own process for distributing the guideline and obtaining feedback. Clinicians are asked to suggest modifications based on their understanding of the clinical literature coupled with their clinical expertise. Representatives from all departments involved in implementation and measurement review the guideline to determine its operational impact. Measurement specifications for selected measures are developed by the Institute for Clinical Systems Improvement (ICSI) in collaboration with participating medical groups following general implementation of the guideline. The specifications suggest approaches to operationalizing the measure.

Guideline Work Group: Second Draft

Following the completion of the "Critical Review" period, the guideline work group meets 1 to 2 times to review the input received. The original guideline is revised as necessary, and a written response is prepared to address each of the suggestions received from medical groups. Two members of the Ob/Gyn Steering Committee carefully review the Critical Review input, the work group responses, and the revised draft of the guideline. They report to the entire committee their assessment of two questions: (1) Have the concerns of the medical groups been adequately addressed? (2) Are the medical groups willing and able to implement the guideline? The committee then either approves the guideline for pilot testing as submitted or negotiates changes with the work group representative present at the meeting.

Pilot Test

Medical groups introduce the guideline at pilot sites, providing training to the clinical staff and incorporating it into the organization's scheduling, computer, and other practice systems. Evaluation and assessment occur throughout the pilot test phase, which usually lasts for three months. Comments and suggestions are solicited in the same manner as used during the "Critical Review" phase.

The guideline work group meets to review the pilot sites' experiences and makes the necessary revisions to the guideline, and the Ob/Gyn Steering Committee reviews the revised guideline and approves it for implementation.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The recommendations for the prevention of preterm birth (PTB) are presented in the form of 7 algorithms with a total of 112 components, accompanied by detailed annotations. Algorithms are provided for: Health Education, Assessment, Monitoring, Management of Signs and Symptoms of Preterm Labor, Monitoring and Management of Prodromal Preterm Labor, Management of Active Preterm Labor, and Management of Preterm Labor with Rupture of Membrane (ROM) or Bleeding. Clinical highlights, a definition of PTL, and selected annotations (numbered to correspond with the algorithms) follow.

Class of evidence (A-D, M, R, X) and conclusion grade (I-III, Not Assignable) definitions are repeated at the end of the "Major Recommendations" field.

Clinical Highlights

1. Identify manageable or modifiable preterm birth (PTB) risk factors in women during a pre-pregnancy or prenatal encounter. (Annotations #3a and 3b, 20)
2. Educate and make appropriate risk-related intervention as soon as possible for women at risk for PTB. (Annotations #15, 20, 22 - see the original guideline document)
3. Monitor pregnancy and risk status at each patient visit and treat according to risk. (Annotations #13, 25)
4. Start appropriate treatment for the type of preterm labor (PTL) involved as soon as possible after PTL is identified. Treatment should be based on specific symptoms as well as gestational age and condition of the mother and fetus. (Annotation #65 - see the original guideline document)
5. Women with uterine contractions who are at high risk and appropriate gestational age should receive a single course of antepartum steroids to promote fetal lung maturity. (Annotations #53, 56, 66, 73, 86, 94, 102 [for Annotations #86, 94, and 102 - see the original guideline document])

Definition of Preterm Labor

1. Labor occurring after 20 and before 37 completed weeks

   plus

2. Clinically documented uterine contractions (4/20 minutes or 6/60 minutes)

   plus

3. (a) Ruptured membranes

   or

   (b) Intact membranes and cervical dilation greater than 2 cm

or

(c) Intact membranes and cervical effacement greater than 80%

or

(d) Intact membranes and cervical change during observation. These can be measured by changes in dilation or effacement, or by changes in cervical length measured clinically or by ultrasound.

Health Education Algorithm Annotations

3a/3b. Provide Risk-Related Education and Evaluate/Is Patient Willing to Change Modifiable Risk Factors?

For each risk factor identified:

Advise of the importance of an early communication with health care provider as soon as pregnancy is suspected. Provide risk-specific interventions and education.

Education:

- Consider available resources and education methods related to risk.

Intervention:

- Review individual risk factors.
- Identify modifiable risk factors: family stress, domestic abuse, tobacco use, alcohol use, sexually transmitted diseases, other chemical use, nutritional concern, low preconception body mass index (BMI), slow prenatal weight gain
- Offer support, interventions, and/or referrals as referred to in the related National Guideline Clearinghouse (NGC) summaries of the Institute for Clinical Systems Improvement (ICSI) guidelines: Domestic Violence, Preventive Counseling and Education, Tobacco Use Prevention and Cessation for Infants, Children and Adolescents, and Tobacco Use Prevention and Cessation for Adults and Mature Adolescents.
- As appropriate:
    - Ask to set a quit or change date, provide educational aids, offer counseling or classes, arrange for follow-up (at least a phone call soon after the quit or change date).
    - Provide information about problems caused by specific behaviors in pregnancy and offer help when ready to change.

Evidence supporting this recommendation is of classes: B, C, R

Assessment Algorithm Annotations

9. Pregnancy Confirmation Evaluation

   This would occur as soon as possible within the first two weeks of provider awareness and would confirm pregnancy.

This can be a patient phone call or clinic visit and can be done by a nurse, nurse practitioner, physician, or midwife. This may include a pregnancy test, examination, or ultrasound for ectopic or miscarriage. This may be incorporated into the reinforcement of low-risk behavior.

Evidence supporting this recommendation is of class: R

10. Pregnant?

Confirmation may be by pregnancy test or by a combination of history and exam. If the confirmation test is negative, the patient should be treated as a pre-pregnancy visit. (See Annotation #1 in the original guideline document).

Patients should be assessed for risk factors for PTB at first prenatal visit.

13. At Risk for Preterm Birth?

The guideline work group acknowledges that some factors are associated with a greater magnitude of risk for PTB than others. For example, a history of prior PTB or myomectomy, or multiple gestation this pregnancy, are of particular concern. Risk factors associated with PTB may include, but are not limited to the following:

Risk Factors for Preterm Birth

A. Historic risk factors and demographics

Currently unmarried
Less than twelfth grade education
Age less than 18 or greater than 35
Prior cone biopsy or loop electrical excision procedure (LEEP)
Greater than or equal to 3 first trimester losses
Any second trimester loss
Prior preterm delivery (PTD)
Prior myomectomy
Cervix dilated greater than 1 cm prior to 32 weeks gestation
Cervical cerclage
Uterine irritability

B. Activated fetal or maternal hypothalamic-pituitary-adrenal axis

Family or life stress
Fetal stress as in intrauterine growth retardation
Cocaine, marijuana, benzodiazepine, or street drug use
Tobacco use

C. Inflammation

Bacterial vaginosis in women with history of PTL
Group-B strep (GBS)*
Sexually transmitted disease

Pyelonephritis or urinary tract infection (UTI)
Other systemic infection or febrile illness

*Although it is not a direct risk factor for PTL, it is important to screen for group B streptococcus to protect the health of the neonate.

D. Decidual hemorrhage

Domestic abuse
Abdominal surgery this pregnancy
Trauma, motor vehicle accident
Vaginal bleeding after 12 weeks this pregnancy

E. Pathologic distention of the uterus

Polyhydramnios
Multiple gestation
Uterine anomalies
Uterine fibroids

F. Maternal illness associated with indicated preterm delivery

Hypertension
Diabetes
Autoimmune problems
Severe cardiac, renal, or pulmonary disease
Hereditary coagulopathies
Hereditary thromboembolic disorders

15. Educate 20-24 Weeks per ICSI Routine Prenatal Care Guideline

All pregnant women should receive information on how to identify and manage signs of possible PTL. If the patient is at risk she will be managed as at risk for PTB.

See original guideline document, Annotation Appendix B, "Patient Education Outline," (or Annotation #20 below).

Evidence supporting this recommendation is of classes: C, D, R

16. Reassess at 28 Weeks and as needed (PRN) Until Term Pregnancy

This reassessment should include digital cervical examination to determine length and extent of dilation, as required by Minnesota Pregnancy Risk Assessment Form developed by the Minnesota Council of Health Plans.

See Appendix A in the NGC summary of the ICSI guideline "Routine Prenatal Care."

Monitoring Algorithm Annotations

20. Provide Education for Preterm Labor and Each Risk Factor Identified

Addressing each risk factor may include treatment, education, or discussion. At-risk patients should be assessed and given educational information about risk factors by 16-20 weeks or any time thereafter when a risk factor is identified.

Educate patient about:

- Individual risk factors for PTB
- Available resources and education related to risk
- Steps to minimize risk of PTL
- Warning signs of PTL and action to be taken
- Other resources available
- Treatments for premature labor:
    - Schedule hospital tour earlier
    - Community support resources
    - Reading list

Patient Education Outline

Warning Signs

If any of the following warning signs are felt, the pregnant mother should empty her bladder, drink 3 to 4 8 oz. glasses of non-caffeinated fluids, and lie on her side while she palpates for uterine activity if there is no change in vaginal discharge.

A. Low, dull backache
B. Menstrual-like cramps
C. Increased pelvic pressure (with or without thigh cramps)
D. Abdominal cramping (with or without diarrhea)
E. Increased uterine activity – more contractions than usual pattern
F. Change in vaginal discharge – colored mucus, fluid leaking, spotting, or bleeding (contact provider immediately)
G. "Something feels different" (e.g., feeling of agitation, flu-like symptoms)

Criteria for Health Care Provider Notification

Notify health care provider if:

A. Any change in vaginal discharge
B. Any of the following warning signs continue after resting for one hour:
    1. Low backache
    2. Menstrual-like cramps
    3. Abdominal cramping
    4. Increased pelvic pressure
    5. "Something feels different"
    6. Five contractions are felt within an hour

Evidence supporting this recommendation is of classes: C, D

22. Intervention: Provide Resources, Treatment and Follow-Up
    - Review individual risk factors.
    - Identify modifiable risk factors: family stress, domestic abuse, tobacco use, alcohol use, sexually transmitted diseases, other chemical use, nutritional concern, low preconception body mass index (BMI), slow prenatal weight gain
    - Offer support, interventions, and/or referrals as referred to in the related National Guideline Clearinghouse (NGC) summaries of the Institute for Clinical Systems Improvement (ICSI) guidelines: Domestic Violence, Preventive Counseling and Education, Tobacco Use Prevention and Cessation for Infants, Children and Adolescents, and Tobacco Use Prevention and Cessation for Adults and Mature Adolescents.
    - As appropriate:
        - Ask to set a quit or change date, provide educational aids, offer counseling or classes, arrange for follow-up (at least a phone call soon after the quit or change date).
        - Provide information about problems caused by specific behaviors in pregnancy and offer help when ready to change.

25. Monitor Pregnancy and Risk Status

    Review signs and symptoms of PTL at each prenatal visit.

    - Please refer to the related NGC guideline summary of the ICSI guideline Routine Prenatal Care regarding assessment of risk factors.
    - Establish accurate gestational age (consider ultrasound prior to 20 weeks to confirm gestational age.)
    - Monitor for risk factors:
        - Drug and alcohol use (urine testing where indicated)
        - Contractions
        - Menstrual cramps
        - Intestinal cramps
        - Constant backache
        - Constant pelvic pressure
        - Vaginal discharge amount and color
        - Urinary frequency
        - Periodic review of: psychosocial situation (referrals as appropriate, include their "support system" in visits and education); stress/anxiety (educate about and assist with sources of stress such as medical limitations for work, day care, home help); dietary inadequacy (educate, assist with referral for food supplement program)
    - Consider other strategies of monitoring:
        - Home health visit
        - Case management
        - Sonogram evaluation of cervix
        - Home uterine activity monitoring in very selected cases

    Evidence supporting this recommendation is of classes: A, C, D, R

26. Change in Status?

Either the patient or the provider can identify a change in status. Patients who note warning signs should contact their health care provider for assessment as soon as possible. The patient should be seen by her provider within two hours of provider contact unless premature rupture of membrane (PROM) or bleeding is present, in which case she should be seen as soon as is feasible.

A change in status may be indicated by any of the following signs:

A. Documented uterine activity (contractions or "irritability")
B. Documented cervical changes
C. Diagnosis of:
    1. Multiple gestation
    2. Third trimester bleeding
    3. Infections (sexually transmitted diseases, group B streptococcus, urinary tract infection, pyelonephritis, etc.)
    4. Any other preterm risk condition
D. Acute leakage of fluid from the vagina
E. Sudden change in fundal height at prenatal visit

Management of Signs and Symptoms of Preterm Labor (PTL) Algorithm Annotations

30. Assessment of Patient with Signs/Symptoms of Possible PTL

Be certain intervention is appropriate including certainty of gestational age. A sonogram should be considered if one has not been done.

A thorough medical evaluation should include the following:

A. Pelvic exam (PE)
B. Sterile speculum exam (SSE)

    This examination should include assessment of nitrazine (pH), pooling, and "ferning" (N,P,F) on an air-dried slide to check for amniotic fluid. This examination is also used to check for the nonuterine etiology of vaginal bleeding (e.g., a cervical lesion).

C. Contraction pattern
D. Determine fetal well-being (may include nonstress test and/or biophysical profile).
E. Laboratory Tests and Possible Treatment:
    1. Urinalysis/urine culture (UAUC)
    2. Consider culture swab of lower third of vagina and rectum for group B streptococcus
    3. Drug screen, even if previously screened and treated
    4. Wet prep for bacterial vaginosis and trichomoniasis
    5. Treatment of bacterial vaginosis infection in pregnant women at high risk for preterm delivery by traditional 7-day courses of therapy early in pregnancy might reduce preterm delivery.

[Conclusion Grade II]. The evidence regarding treatment of low-risk pregnant women with asymptomatic bacterial vaginosis is limited by use of inadequate therapy in the available studies. [Conclusion Grade Not Assignable] [See Conclusion Grading Worksheet - Appendix A of the original guideline document, - Annotation #30 (Bacterial Vaginosis)].

6. Consider cultures for gonorrhea and chlamydia

Consider nonintervention near term if gestational age is well documented. Do not inhibit labor where there is fetal or maternal jeopardy, fetal malformation, or death.

35. Further Medical Evaluation

Check cervix and collect specimen for possible fetal fibronectin (fFN) if cervix appears less than 3 cm.

While fFN is Food and Drug Administration (FDA)-approved, the significance of a positive test in clinical practice is not yet determined. Please refer to Institute for Clinical Systems Improvement (ICSI) Technology Assessment #47, Fetal Fibronectin for the Prediction of Preterm Labor.

43. Cervix Dilated 5+cm/Advanced Preterm Labor

If cervix is dilated 5+cm, the following emergency resuscitation protocol should be followed to determine whether transport is appropriate. In addition, the following protocol should be followed:

A. At 23 to 34 weeks administer first dose betamethasone STAT. Please refer to Annotation #73, "Pharmacologic Management of PTL" for information on dosing of betamethasone and other corticosteroids.
B. Delivery of less than 24 weeks as previable
C. Initiate tocolysis if possible. Please refer to Annotation #66, "Possibly Initiate Tocolytics, Betamethasone and Antibiotic Group B strep (GBS) Prophylaxis; Possible Antibiotic Treatment for Preterm Labor" for more information on tocolysis.
D. Screening sonogram to rule out (R/O) gross anomaly, check presentation, placental abnormality.

45. Transfer Mother to Appropriate Level of Care for Preterm Delivery

Maternal transfer to prevent the need for premature neonatal transfer reduces preterm neonatal morbidity and mortality. Very low birth weight infants (less than 1500 grams) inborn to Level III perinatal centers have lower mortality, reduced incidence of Grade III and Grade IV intraventricular hemorrhage, and lower sensorineural disability rates than outborn infants.

Evidence supporting this recommendation is of class: C

Monitoring and Management of Prodromal Preterm Labor Algorithm Annotations

50. Initial Management

Management of prodromal labor should include close observation with a recheck of the cervix 1 to 2 hours after initial check. The following steps may be indicated.

A. Urinalysis
B. Hydration if indicated
C. Individual doses subcutaneous terbutaline if needed unless medically contraindicated. See Annotation #66, "Possibly Initiate Tocolytics, Betamethasone and Antibiotic Group B strep (GBS) Prophylaxis" for more information on administering tocolytics.
D. Fetal monitoring
E. Take steps to reduce uterine irritability such as reduced physical activity: no exercise, lifting, household or yard activity; and no orgasm, intercourse, or nipple stimulation.
F. Betamethasone if 23 to 34 weeks gestation and high risk for preterm delivery. See Annotation #73, "Pharmacologic Management of PTL" for information on dosing of betamethasone and other corticosteroids.

   Previous preterm delivery, myomectomy, and multiple gestation are risk factors of particular concern.

53. Bed rest and Pelvic Rest for 48 Hours and Administer Betamethasone if High Risk for Preterm Delivery and 23-34 Weeks

A full obstetric sonogram should be done if no recent obstetric sonogram results are readily available and if no cervical change is indicated on the second cervical check.

- Bed rest or pelvic rest for 48 hours

  The number of hours of bed rest (during the day or complete bed rest with bathroom privileges) needs to be determined based upon risk of PTL and patient's environment. Bed rest and careful intravenous or oral hydration may be sufficient to stop some episodes of PTL.

- Administer betamethasone if the patient is between 23 and 34 weeks gestation and at high risk for preterm delivery. See Annotation #73, "Pharmacologic Management of PTL" for information on dosing of betamethasone and other corticosteroids.

56. Continue Intensive (at Least Weekly) Follow-up Until 34 Weeks Plus 6 Days/Consider Betamethasone (23-34 weeks)

Patients who test positive for fFN might be more likely to benefit from aggressive therapy, closer surveillance, and corticosteroid administration to decrease the complications associated with PTB.

See Annotation #25, "Monitor Pregnancy and Risk Status." See Annotation #73, "Pharmacologic Management of PTL" for information on dosing of betamethasone and other corticosteroids.

60. Continue Monitoring fFN

If fFN is negative, reassure patient and continue monitoring fFN weekly or every two weeks until 34 weeks plus 6 days as long as symptoms persist.

Patients who have a negative fFN have a less than one-percent chance of PTL in the next 7 days. The patient will need to be retested to assess the subsequent risk of PTL. See ICSI Technology Assessment #47, Fetal Fibronectin for the Prediction of Preterm Labor.

Management of Active Preterm Labor Algorithm Annotations

66. Possibly Initiate Tocolytics, Betamethasone and Antibiotic Group B Streptococcus (GBS) Prophylaxis; Possible Antibiotic Treatment for Preterm Labor

Agents to be considered for tocolytic therapy include magnesium sulfate, terbutaline sulfate (including pump), indomethacin, and nifedipine. In February 1997, the Food and Drug Administration (FDA) alerted practitioners to use caution in the continuous subcutaneous administration of terbutaline sulfate.

The ICSI Technology Assessment #49, Tocolytic Therapy for Preterm Labor states that studies of ritodrine, magnesium sulfate, and calcium channel blockers such as nifedipine, show that they may be equally effective in delaying delivery by 24 to 48 hours. See Discussion and References section in the original guideline document.

Other considerations for initial management of PTL include the following:

A. Initiate betamethasone if 24 to 34 weeks gestation. Please refer to Annotation #73, "Pharmacologic Management of PTL" for more information on administration of betamethasone and other corticosteroids.
B. Administer intravenous antibiotic effective against group B streptococcus until group B streptococcus results are back or if patient is known to be positive for group B streptococcus.
C. Activity limitation as indicated.
D. Order additional laboratory analysis pertinent to tocolytic being used.

Although use of magnesium sulfate as a tocolytic is nearly universal, a recent concern regarding safety has been expressed. Magnesium sulfate use is being examined as having value in reducing cerebral palsy; however, excessive doses may contribute to fetal mortality.

73. Pharmacologic Management of Preterm Labor
    A. Tocolysis and Betamethasone

Management of PTL should include parenteral tocolysis for 48 hours with administration of 2 doses of betamethasone. See Annotation #66 "Possibly Initiate Tocolytics, Betamethasone and Antibiotic group B streptococcus Prophylaxis; Possible Antibiotic Treatment for Preterm labor."

The usual dosage regimen is betamethasone 12 mg intramuscularly STAT then repeat in 24 hours.

Treatment should be initiated in women with any symptoms or signs which might herald the onset of preterm delivery or a potential need for elective birth, rather than waiting until the diagnosis is in no doubt. While a single complete course of antenatal steroids provides significant multiple benefits to the preterm neonate, multiple courses should not be used. See the National Institutes of Health (NIH) Consensus Statement referenced in the discussion section of the original guideline document.

Treatment should not be withheld because delivery appears to be imminent.

The beneficial effects of corticosteroids are greatest more than 24 hours after beginning treatment. However, treatment less than 24 hours in duration may improve outcome. Every effort should be made to treat women before spontaneous or elective preterm delivery.

An alternative medication is dexamethasone for a total of 24 mg (usual dosing regimen is 6 mg intramuscularly every 12 hours times four doses).

Evidence supporting this recommendation is of classes: A, R

B. Administer antibiotics for group B streptococcus prophylaxis until group B streptococcus results are back.

Evidence supporting this recommendation is of classes: M, R

75. Attempt to Discontinue Tocolysis

If persistent mild uterine activity continues, consider nifedipine. For more information on tocolysis, see ICSI Technology Assessment #49, Tocolytic Therapy for Preterm Labor.

80. Aggressive Management with Tocolysis

Tocolysis should be continued if necessary until fetal lung maturity is documented or maternal or fetal complications arise for which preterm delivery is indicated.

The etiology of PTL remains obscure. Consequently, patients who continue to have regular uterine activity and/or gradual cervical changes on parenteral

tocolysis must be managed with clinical judgment balancing the risks to the mother of ongoing tocolysis against the risks of PTB for the neonate.

The use of more than a single tocolytic agent greatly increases the risks to the mother and should be undertaken only by experienced obstetric specialists in well-selected cases. For more information see ICSI Technology Assessment #49, Tocolytic Therapy for Preterm Labor.

Management of Preterm Labor with Rupture of Membrane (ROM) or Bleeding Algorithm Annotations

84. Sterile Speculum Visual Estimate of Cervical Dilation and Effacement

Digital cervical exam should not be performed to confirm presentation in the presence of preterm rupture of membranes until imminent delivery is documented or required in the patient actively laboring (if a sonogram is unavailable). Delaying digital examination reduces infection.

Digital examination in the bleeding patient should be deferred until it is certain the patient does not have placenta previa.

Visualize cervix as well as possible to:

A. Rule out previa, abruption, and non-obstetrical causes of bleeding such as cervical cancer.
B. Estimate dilation and effacement and obtain samples for gonorrhea, chlamydia, and group B streptococcus.
C. Perform bedside obstetric sonogram if feasible.

86. Initial Dose Betamethasone STAT, and Plan for Delivery

Please refer to Annotation #73, "Pharmacologic Management of PTL" for information on dosing of betamethasone and other corticosteroids.

88. Stabilize on Magnesium Sulfate As Indicated/Transfer Mother to Appropriate Level of Care if Possible

Magnesium sulfate ($MgSO_4$) is generally given as a 4-gm intravenous bolus then a 2-gm/hour intravenous infusion. If no intravenous access is available, magnesium sulfate can be given intramuscularly (5g intramuscularly in each buttock for a total of 10g) to stabilize a patient for transfer.

Patients with renal insufficiency require reduced dosages. If there is a clinical concern, magnesium levels should be checked. Therapeutic levels are 5 to 8 mEq/L.

Patients should retain deep tendon reflexes throughout the course of therapy. Flushing, "warmth," and nausea are common nuisance side effects.

Antiemetics are encouraged if nausea persists after the initiation of therapy.

90. Initial Management of Preterm Labor with Rupture of Membranes

In the presence of PTL with rupture of membranes, intravenous access is essential. The patient should be on strict bed rest and receive a white blood cell count (WBC) daily for 72 hours, then twice weekly. A rising WBC may precede clinically apparent chorioamnionitis and allow timing of delivery to prevent neonatal sepsis; however, no studies regarding its use and subsequent neonatal outcome are available. Betamethasone will spuriously increase the WBC, however.

An uncontaminated urine culture should be performed. Consider a catheterized specimen if vaginal infection is present and/or patient is actively leaking fluid.

94. Betamethasone 23-32 Weeks

Please refer to Annotation #73, "Pharmacologic Management of PTL" for information on dosing of betamethasone and other corticosteroids.

Evidence supporting this recommendation is of class: A

95. Antibiotic Prophylaxis for Possible GBS According to Institutional Protocols/Consider Tocolysis up to 48 Hours to Facilitate Transfer

Broad-spectrum antibiotic coverage appears to lengthen the latency from preterm premature rapture of membranes (pPROM) until delivery and/or chorioamnionitis. Antibiotic therapy reduces maternal and neonatal morbidity in women with pPROM. There is no consensus on the choice of antibiotic or dose. A combination of ampicillin and erythromycin appears promising. [Conclusion Grade II: See Conclusion Grading Worksheet - Appendix B of the original guideline document, - Annotation #95 (Antibiotic Therapy)].

Tocolysis should be considered in selected patients remote from term to delay delivery until transfer to a higher level care.

Evidence supporting this recommendation is of classes: A, C, M, R

96. Vaginal Pool ± Amnio at 32+ Weeks for Fetal Lung Maturity (FLM)

Phosphatidyl glycerol (PG) is a reliable indicator of FLM if present in vaginal pool specimens. The lecithin/sphingomyelin (L/S) ratio is unreliable if blood and/or meconium are present in the fluid. Certain assays of PG may be influenced by the presence of heavy growth of gardnerella vaginalis. Please consult with your local hospital clinical laboratory.

Evidence supporting this recommendation is of class: R

101. Initial Management of Preterm Labor with Bleeding

In the presence of PTL with bleeding, intravenous access is essential.

A. The patient should be on strict bed rest.
B. Blood should be typed and crossmatched.
C. Complete blood counts (CBC's) with platelets, prothrombin time (PT), partial thromboplastin time (PTT), fibrinogen.
D. Continue fetal monitoring while bleeding.

102. Betamethasone 23-34 Weeks

Please refer to Annotation #73, "Pharmacologic Management of PTL" for information on dosing of betamethasone and other corticosteroids.

103. Antibiotics for GBS Prophylaxis/Transfusion As Needed/Consider Tocolysis

See Annotation #66, "Possibly Initiate Tocolytics, Betamethasone and Antibiotic group B Streptococcus Prophylaxis; Possible Antibiotic Treatment for Preterm Labor" for more information.

Monitoring Algorithm Annotations

108. Continuation of Pregnancy?

This pertains to women who have completed 37 weeks of pregnancy and experienced failure of tocolytic therapy or deteriorating maternal/fetal health.

109. Preterm Delivery

Definitions:

Term: 37 or more completed weeks of gestation.

Preterm: 32 or more and less than 37 completed weeks of gestation.

Very Preterm: less than 32 completed weeks of gestation.

For deliveries that occur prior to 37 completed weeks of gestation, review of the prenatal course should be done at the time of delivery. This should include review of any identifiable risk factors or other contributing events that might have led to the PTB. Any potentially preventable events should be reviewed with the involved parties.

111. 4-6 Week Postpartum Visit

The first postpartum visit should be used as an opportunity to review the prenatal course and delivery events with the patient.

A. For patients who deliver full term, this should be a time to reinforce good health practices.
B. For patients who experienced preterm labor yet were able to deliver at term, review of successful therapy (for PTL) and the patient's role in successfully complying with prescribed therapy should be emphasized.

C. For patients who deliver prior to term, the postpartum visit is a time to review risk factors, identify risk factors which are modifiable, and help the patient understand how she might modify or eliminate these risk factors prior to any subsequent pregnancy. This is also an opportunity to discuss other possible management plans in subsequent pregnancies.

Definitions:

Conclusion Grades:

Grade I: The evidence consists of results from studies of strong design for answering the question addressed. The results are both clinically important and consistent with minor exceptions at most. The results are free of any significant doubts about generalizability, bias, and flaws in research design. Studies with negative results have sufficiently large samples to have adequate statistical power.

Grade II: The evidence consists of results from studies of strong design for answering the question addressed, but there is some uncertainty attached to the conclusion because of inconsistencies among the results from the studies or because of minor doubts about generalizability, bias, research design flaws, or adequacy of sample size. Alternatively, the evidence consists solely of results from weaker designs for the question addressed, but the results have been confirmed in separate studies and are consistent with minor exceptions at most.

Grade III: The evidence consists of results from studies of strong design for answering the question addressed, but there is substantial uncertainty attached to the conclusion because of inconsistencies among the results of different studies or because of serious doubts about generalizability, bias, research design flaws, or adequacy of sample size. Alternatively, the evidence consists solely of results from a limited number of studies of weak design for answering the question addressed.

Grade Not Assignable: There is no evidence available that directly supports or refutes the conclusion.

Study Quality Designations:

The quality of the primary research reports and systematic reviews are designated in the following ways on the conclusion grading worksheets:

Positive: indicates that the report or review has clearly addressed issues of inclusion/exclusion, bias, generalizability, and data collection and analysis.

Negative: indicates that these issues (inclusion/exclusion, bias, generalizability, and data collection and analysis) have not been adequately addressed.

Neutral: indicates that the report or review is neither exceptionally strong nor exceptionally weak.

Not Applicable: indicates that the report is not a primary reference or a systematic review and therefore the quality has not been assessed.

Classes of Research Reports:

A. Primary Reports of New Data Collection:

Class A:

- Randomized, controlled trial

Class B:

- Cohort study

Class C:

- Nonrandomized trial with concurrent or historical controls
- Case-control study
- Study of sensitivity and specificity of a diagnostic test
- Population-based descriptive study

Class D:

- Cross-sectional study
- Case series
- Case report

B. Reports that Synthesize or Reflect upon Collections of Primary Reports:

Class M:

- Meta-analysis
- Systematic review
- Decision analysis
- Cost-effectiveness analysis

Class R:

- Consensus statement
- Consensus report
- Narrative review

Class X:

- Medical opinion

CLINICAL ALGORITHM(S)

Detailed and annotated clinical algorithms are provided for:

- Health Education
- Assessment
- Monitoring
- Management of Signs and Symptoms of Preterm Labor
- Monitoring and Management of Prodromal Preterm Labor
- Management of Active Preterm Labor
- Management of Preterm Labor with Rupture of Membrane (ROM) or Bleeding

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The guideline contains an annotated bibliography and discussion of the evidence supporting each recommendation. The type of supporting evidence is classified for selected recommendations (see "Major Recommendations").

In addition, key conclusions contained in the Work Group's algorithm are supported by a grading worksheet that summarizes the important studies pertaining to the conclusion. The type and quality of the evidence supporting these key recommendations (i.e., choice among alternative therapeutic approaches) is graded for each study.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Overall, decreased risk and rate of preterm birth (PTB)
- Appropriate management of preterm labor (PTL)
- Decreased maternal and neonatal morbidity and mortality
- Increased routine identification of PTB risk factors in all pregnant women
- Increased rate of interventions for identified PTB risk factors
- Increased patient education for PTB prevention and preterm labor signs and symptoms for at-risk patients
- Increased rate of appropriate interventions for identified change in status in women with PTB risk factors
- Increased percentage of women with preterm labor and/or PTBs who receive betamethasone

POTENTIAL HARMS

- Side effects of pharmacologic management. For example, although the side effects of tocolytic therapy are relatively minor, they can be major and life threatening, including pulmonary edema, cardiac arrest, and death. Excessive doses of magnesium sulfate may contribute to fetal mortality.
- False test results. For example, the risks and limitations of testing for fetal fibronectin (fFN) are related to the false negative rate and the false positive rate.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

- These clinical guidelines are designed to assist clinicians by providing an analytical framework for the evaluation and treatment of patients, and are not intended either to replace a clinician's judgment or to establish a protocol for all patients with a particular condition. A guideline will rarely establish the only approach to a problem.
- This medical guideline should not be construed as medical advice or medical opinion related to any specific facts or circumstances. Patients are urged to consult a health care professional regarding their own situation and any specific medical questions they may have.
- The guideline work group recognizes that the clinician is the only person who has full understanding of a clinical situation and knowledge of the presence of confounding maternal or fetal factors which will influence the degree of adherence to the guideline's suggestions. Examples of maternal or fetal factors include fetal compromise, maternal heart disease, and severe pre-eclampsia, among others.
- While fetal fibronectin (fFN) is Food and Drug Administration (FDA)-approved, the significance of a positive test in clinical practice is not yet determined.
- The evidence regarding treatment of low-risk, pregnant women with asymptomatic bacterial vaginosis is limited by use of inadequate therapy in the available studies.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

Once a guideline is approved for general implementation, a medical group can choose to concentrate on the implementation of that guideline. When four or more groups choose the same guideline to implement and they wish to collaborate with others, they may form an action group.

In the action group, each medical group sets specific goals they plan to achieve in improving patient care based on the particular guideline(s). Each medical group shares its experiences and supporting measurement results within the action group. This sharing facilitates a collaborative learning environment. Action group learnings are also documented and shared with interested medical groups within the collaborative.

Currently, action groups may focus on one guideline or a set of guidelines such as hypertension, lipid treatment, and tobacco cessation.

Detailed measurement strategies are presented in the original guideline document to help close the gap between clinical practice and the guideline recommendations. Summaries of the measures are provided in the National Quality Measures Clearinghouse (NQMC).

IMPLEMENTATION TOOLS

Clinical Algorithm
Pocket Guide/Reference Cards
Quality Measures

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

RELATED NQMC MEASURES

- Preterm birth prevention: percentage of modifiable preterm birth (PTB) risk factors screened for all pregnant women.
- Preterm birth prevention: percentage of all identified preterm birth (PTB) modifiable risk factors assessed that receive an intervention.
- Preterm birth prevention: percentage of at-risk women with documentation of education for preterm birth (PTB) at recommended intervals.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness
Timeliness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Institute for Clinical Systems Improvement (ICSI). Preterm birth prevention. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2004 Jul. 56 p. [94 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

1995 Jul (revised 2004 Jul)

GUIDELINE DEVELOPER(S)

Institute for Clinical Systems Improvement - Private Nonprofit Organization

GUIDELINE DEVELOPER COMMENT

Organizations participating in the Institute for Clinical Systems Improvement (ICSI): Affiliated Community Medical Centers, Allina Medical Clinic, Altru Health System, Aspen Medical Group, Avera Health, CentraCare, Columbia Park Medical Group, Community-University Health Care Center, Dakota Clinic, ENT SpecialtyCare, Fairview Health Services, Family HealthServices Minnesota, Family Practice Medical Center, Gateway Family Health Clinic, Gillette Children's Specialty Healthcare, Grand Itasca Clinic and Hospital, Hamm Clinic, HealthEast Care System, HealthPartners Central Minnesota Clinics, HealthPartners Medical Group and Clinics, Hennepin Faculty Associates, Hutchinson Area Health Care, Hutchinson Medical Center, Lakeview Clinic, Mayo Clinic, Mercy Hospital and Health Care Center, MeritCare, Minnesota Gastroenterology, Montevideo Clinic, North Clinic, North Memorial Health Care, North Suburban Family Physicians, NorthPoint Health & Wellness Center, Northwest Family Physicians, Olmsted Medical Center, Park Nicollet Health Services, Quello Clinic, Ridgeview Medical Center, River Falls Medical Clinic, St. Mary's/Duluth Clinic Health System, St. Paul Heart Clinic, Sioux Valley Hospitals and Health System, Southside Community Health Services, Stillwater Medical Group, SuperiorHealth Medical Group, University of Minnesota Physicians, Winona Clinic, Winona Health

ICSI, 8009 34th Avenue South, Suite 1200, Bloomington, MN 55425; telephone, (952) 814-7060; fax, (952) 858-9675; e-mail: icsi.info@icsi.org; Web site: www.icsi.org.

SOURCE(S) OF FUNDING

The following Minnesota health plans provide direct financial support: Blue Cross and Blue Shield of Minnesota, HealthPartners, Medica, Metropolitan Health Plan, PreferredOne, and UCare Minnesota. In-kind support is provided by the Institute for Clinical Systems Improvement's (ICSI) members.

GUIDELINE COMMITTEE

Ob/Gyn Steering Committee

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Work Group Members: Carol Stark, MD (Work Group Leader) (Family HealthServices Minnesota) (Family Practice); John Jefferies, MD (Mayo Clinic) (Obstetrics/Gynecology); John Vickers, MD (HealthPartners Medical Group) (Obstetrics/Gynecology); Peter Mark, MD (Park Nicollet Health Services) (Obstetrics/Gynecology); Judy Ney, MD (Allina Medical Clinic) (Perinatology); Leslie Pratt, MD (Park Nicollet Health Services) (Perinatology); Caren Jacobs, PharmD,(Fairview Southdale) (Pharmacy); Julie Rice, RN, Women's Health NP (Park Nicollet Health Services) (Obstetrics/Gynecology Nurse Practitioner); Corinne Esch, RN (HealthPartners Medical Group) (Obstetrics/Gynecology Nursing); Mary Johnson, RN (MeritCare) (Obstetrics/Gynecology Nursing); Rick Carlson, MS (HealthPartners Medical Group) (Measurement Advisor); Nancy Jaeckels (Institute for Clinical Systems Improvement) (Implementation Advisor); Nancy Greer, PhD (Institute for Clinical Systems Improvement) (Evidence

Analyst); Linda Setterlund, MS (Institute for Clinical Systems Improvement) (Facilitator)

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

In the interest of full disclosure, Institute for Clinical Systems Improvement (ICSI) has adopted a policy of revealing relationships work group members have with companies that sell products or services that are relevant to this guideline topic. The reader should not assume that these financial interests will have an adverse impact on the content of the guideline, but they are noted here to fully inform readers. Readers of the guideline may assume that only work group members listed below have potential conflicts of interest to disclose.

No work group members have potential conflicts of interest to disclose.

ICSI's conflict of interest policy and procedures are available for review on ICSI's website at www.icsi.org.

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previously released version: Institute for Clinical Systems Improvement (ICSI). Preterm birth prevention. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2003 Jul. 58 p.

GUIDELINE AVAILABILITY

Electronic copies: Available from the Institute for Clinical Systems Improvement (ICSI) Web site.

Print copies: Available from ICSI, 8009 34th Avenue South, Suite 1200, Bloomington, MN 55425; telephone, (952) 814-7060; fax, (952) 858-9675; Web site: www.icsi.org; e-mail: icsi.info@icsi.org.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- ICSI pocket guidelines. April 2004 edition. Bloomington (MN): Institute for Clinical Systems Improvement, 2004. 404 p.

Print copies: Available from ICSI, 8009 34th Avenue South, Suite 1200, Bloomington, MN 55425; telephone, (952) 814-7060; fax, (952) 858-9675; Web site: www.icsi.org; e-mail: icsi.info@icsi.org.

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI on February 5, 2003. The information was verified by the guideline developer on February 20, 2003. This summary was updated by ECRI on April 16, 2004 and again on November 29, 2004.

COPYRIGHT STATEMENT

Date Modified: 1/17/2005